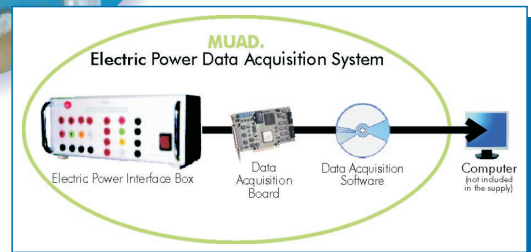
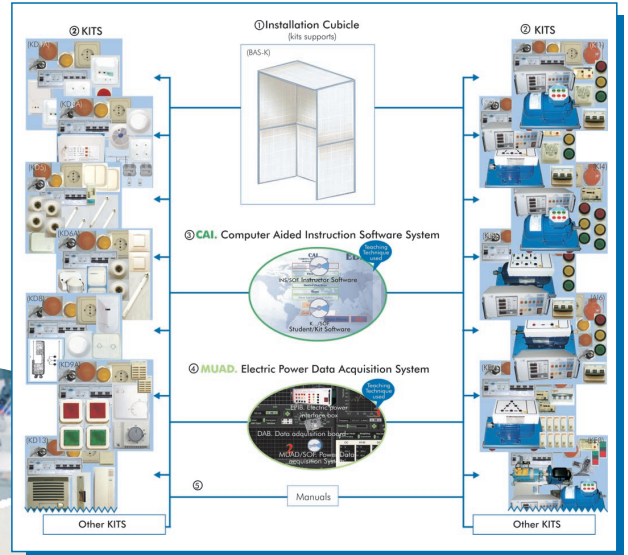
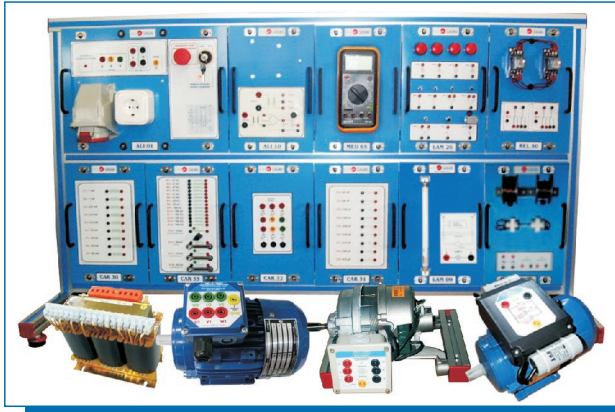


# TECHNICAL AND VOCATIONAL EDUCATION ELECTRICITY LABORATORY (4TV)



\* Center:

\* Country:

\* Date:

\* Issue:

## Quality Certificates:



ISO 9000: Quality Management  
(for Design, Manufacturing,  
Commercialization and After-sales service)



European Union Certificate  
(total safety)



Certificates ISO 14000 and  
ECO-Management and Audit Scheme  
(environmental management)



Worlddidac Quality Charter  
Certificate  
(Worlddidac Member)

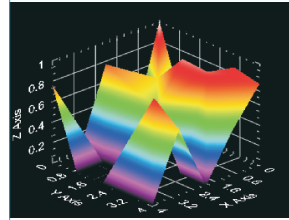
# Technical and Vocational Education Electricity Laboratory (4TV)

## Index

- Project content.
- Technical areas available.
- Economical proposal.
- Classroom and Laboratory Lay Out (Example).
- Main teaching units (included in priority 1).
- Main target.
- Project options covered.
- Project conditions.
- Teaching techniques used.

# Project content

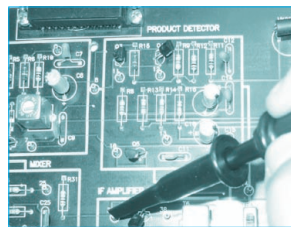
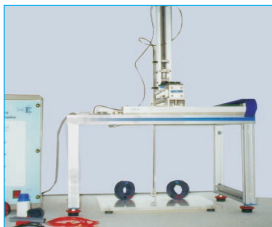
## Modern design



## Main blocks



## Products



## Full units design



## Technical areas available

- Physics
- Electronics.
- \* **Electricity**
- Energy.
- Automation & Systems.
- Process Control.
- Complements, Instruments and Tools.

**\*Main area directly related with Electricity laboratory labelled in bold letters.**

Note: The complete technical design "is ready" at our premises

# Economical Proposal

## Teaching Units:

### **"Priority 1"**

#### **0200. Electronics**

0213-210/20S: Elementary Electronics (20 CAI + CAL)  
 0213-211/20S: Elementary Electronics (20 CAI + CAL)  
 0213/5B: Elementary Electronics (5EBC-100)  
 0222K-220K/20S: Elementary Electronics "KIT" (20 CAI + CAL)  
 0222K-221K/20S: Elementary Electronics "KIT" (20 CAI + CAL)  
 0222K/5B: Elementary Electronics "KIT" (5 FACO + M15)  
 0260: Industrial Electronics Module

#### **0400. Electricity**

0413-410/20S: Domestic Electric Installations (20 CAI + CAL)  
 0413-411/20S: Domestic Electric Installations (20 CAI + CAL)  
 0413-412/20S: Domestic Electric Installations (20 CAI + CAL)  
 0413/5A: Domestic Electric Installations (5 MUAD)  
 0423K-420K/20S: Domestic Electric Installations "kit" (20 CAI + CAL)  
 0423K-421K/20S: Domestic Electric Installations "kit" (20 CAI + CAL)  
 0423K-422K/20S: Domestic Electric Installations "kit" (20 CAI + CAL)  
 0423/5B: Domestic Electric Installations "kit" (5 BASK + CABD)  
 0433-430/20S: Industrial Electric Installations (20 CAI + CAL)  
 0433-431/20S: Industrial Electric Installations (20 CAI + CAL)  
 0433-432/20S: Industrial Electric Installations (20 CAI + CAL)  
 0443K-440K/20S: Industrial Electric Installations "kit" (20 CAI + CAL)  
 0443K-441K/20S: Industrial Electric Installations "kit" (20 CAI + CAL)  
 0443K-442K/20S: Industrial Electric Installations "kit" (20 CAI + CAL)  
 0453-450/20S: Energy Installations (20 CAI + CAL)  
 0453-451/20S: Energy Installations (20 CAI + CAL)  
 0453-452/20S: Energy Installations (20 CAI + CAL)  
 0463K-460K/20S: Energy Installations "kit" (20 CAI + CAL)  
 0463K-461K/20S: Energy Installations "kit" (20 CAI + CAL)  
 0463K-462K/20S: Energy Installations "kit" (20 CAI + CAL)  
 0470: Demonstration Electrical Module  
 0471/20S: Electricity Basic Concepts Module (20 CAI + CAL)  
 0472/20S: Industrial Relays Basic Module (20 CAI + CAL)  
 0473/20S: Industrial Relays Medium Module (20 CAI + CAL)  
 0480: Electrical Machines Basic Module  
 0481: Electrical Machines Medium Module  
 0482: Electrical Machines Advanced Module  
 0483: Electrical Machines "Disassembly" Module  
 0490: Cut Away Motors Basic Module  
 0491: Cut Away Motors Medium Module  
 0492: Cut Away Motors Advanced Module

#### **0600 Automation & Systems**

0633/10S: Industrial PLC (Any)  
**1000 Process Control**  
 1010: Process Control Basic Module  
 1010/PLC: PLC's Module  
 1000/ESN: EDIBON Scada-Net for Electronics, Electricity & Process Control Units

### **"Priority 2"**

#### **0200. Electronics**

0230: Transducers and Sensors Module  
 0232: Controllers  
 0240: Control Electronics Module  
 0250: Digital Electronics Module

#### **0500. Energy**

0510: Energy: Modular Power System Simulator Basic Module  
 0511: Energy: Modular Power Simulator  
 0530/20S: Basic Renewable Energies (20 CAI + CAL)  
 0530/PLC: PLCs Module  
 0538/20S: Turbine Troubleshooting Renewable Energies (20 CAI + CAL)  
 0538/PLC: PLCs Module

#### **1000. Process Control**

1011: Process Control Medium Module  
 1011/PLC: PLC's Module

### **"Priority 3"**

#### **0100. Physics, Chemistry and Biology**

0110: 3D Physics Basic Module

#### **0500. Energy**

0520: Energy: Advanced Power Plant Simulator Basic  
 0521: Energy: Advanced Power Plant Simulator Medium  
 0522: Energy: Advanced Power Plant Simulator Advanced

#### **0600. Automation & Systems**

0610: PLC Trainer  
 0620: PLC Process Emulators Applications Module  
 0621: PLC Small Scale Real Applications Module  
 0650: Automation & System Module  
 0651: Automation (Regulation and Control) Module

#### **1000. Process Control**

1020: Industrial Process Module  
 1020/PLC: PLC's Module

## Complements, Instruments and Tools:

### **5100. Complements, Instruments and Tools**

5110-1: Cupboard & Shelves Module  
 5120-10: Computer Module  
 5122: Teaching Aids Module  
 5124: Complete Health & Safety  
 5142-1: Electricity Toolkit Module  
 5143-20: Electronics Toolkit Module

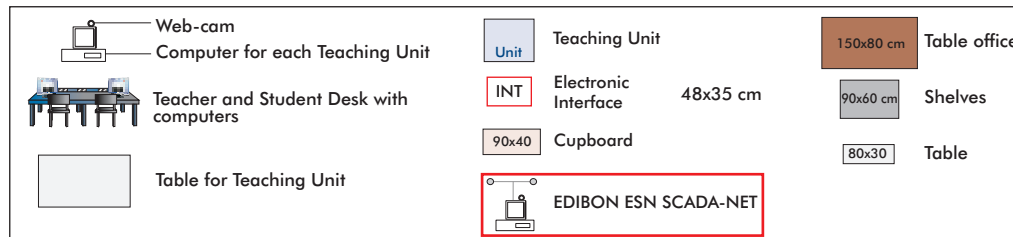
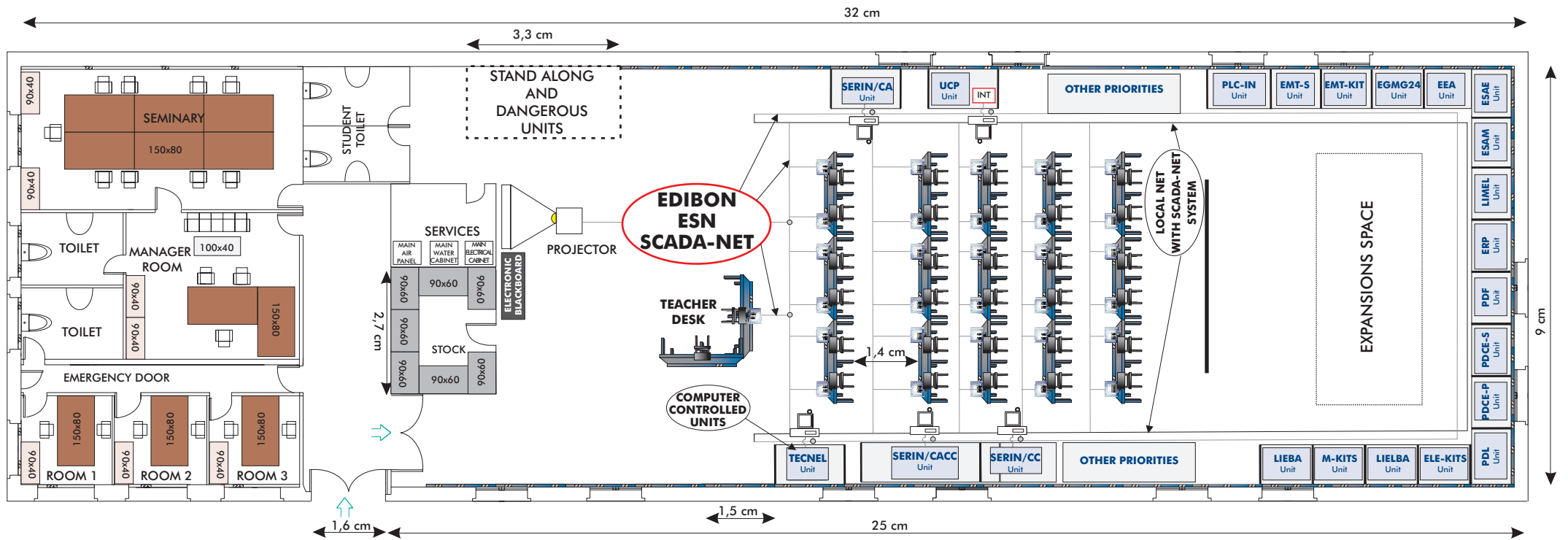
## Services:

- \* Furnitures:
- \* Electrical, Water and Air Installation and others laboratory services
- \* Installation of all units supplied, Starting up, Training, Teacher Training and Technology Transfer

# Classroom and Laboratory Lay Out

## TECHNICAL AND VOCATIONAL EDUCATION ELECTRICITY LABORATORY

(Example of Priority 1)  
(4TV)



E: 1:100

# Main Teaching Units (included in priority 1)

## Priority 01:

<b>LIEBA</b>	Basic Electronics and Electricity Integrated Laboratory.
<b>M-KITS</b>	Basic Electronics and Electricity Assembly Kits.
<b>LIELBA</b>	Electrical Installations Integrated Laboratory.
<b>TECNEL</b>	<u>Computer Controlled</u> Teaching Unit for the Study of Power Electronics. (Converters: DC/AC+AC/DC+DC/DC+AC/AC).
<b>SERIN/CACC</b>	<u>Computer Controlled</u> Industrial Servosystems Trainer (for AC and DC Motors).
<b>ELE-KITS</b>	Electrical Installations Assembly Kits.
<b>PDL</b>	Lamps Demonstration Panel.
<b>PDCE-P</b>	Electric Cables Demonstration Panel (Power).
<b>PDCE-S</b>	Electric Cables Demonstration Panel (Signaling).
<b>PDF</b>	Fuses Demonstration Panel.
<b>ERP</b>	Protection Relay Test.
<b>LIMEL</b>	Integrated Laboratory for Electrical Machines
<b>ESAM</b>	Faults Simulation Trainer in Electrical Motors.
<b>ESAE</b>	Electrical Faults Simulation Trainer
<b>EEA</b>	Alternators Study Unit.
<b>EGMG24</b>	Motor -Generator Group
<b>TECNEL</b>	<u>Computer Controlled</u> Teaching Unit for the Study of Power Electronics. (Converters: DC/AC+AC/DC+DC/DC+AC/AC).
<b>SERIN/CC</b>	<u>Computer Controlled</u> Industrial Servosystems Trainer (for DC Motors).
<b>SERIN/CA</b>	<u>Computer Controlled</u> Industrial Servosystems Trainer (for AC Motors).
<b>EMT-KIT</b>	Disassembly Machines Kit.
<b>EMT-S</b>	Cut Away Motors.
<b>PLC-IN</b>	PLC Industrial Control System
<b>UCP</b>	<u>Computer Controlled</u> Process Control System (with electronic control valve).

## Main target

\* To help the students:

- By "quick" understanding.
- By "clear" understanding (clear concepts).
- By "saving" time.
- By "extending" the laboratory to their homes.

\* To help the teachers:

- By "easy" teaching.
- By increasing the teaching "efficiency".
- By "reducing" teaching costs (less time consume).
- By "integrating" classroom and laboratory in the same place.



## Project options covered

This “Technical and Vocational Education Electricity Laboratory” will cover the following:

- a) To train students at laboratory.
- b) To train trainers.
- c) To be used for training and update educators in current teaching technologies.
- d) To give courses to workers in the industry, as it simulates industrial process.
- e) To be used for carrying out applied research, in several processes and different technical areas.
- f) To be used as research tool for international projects.
- g) To train other countries teachers.

## Project conditions

The “Technical and Vocational Education Electricity Laboratory” includes the following technical and commercial conditions:

a) Technical conditions:

- Laboratories adaptation.
- Installation of all units supplied.
- Starting up for all units.
- Training about the exercises to be done with any unit.
- Teacher training related with the teaching unit and the teaching techniques used.
- Technology transfer.

b) Commercial conditions:

- Packing.
- Financing Charges.
- C.I.F. Charges.

c) Other conditions:

- 8 Manuals for each teaching equipment:
  - . Required services manual.
  - . Assembly and installation manual.
  - . Interface and software/control console manual.
  - . Set in operation manual.
  - . Safety norms manual.
  - . Practices manual.
  - . Maintenance manual.
  - . Calibration manual.

# TEACHING TECHNIQUES USED

## 3D. EDIBON THREE DIMENSIONS SYSTEM



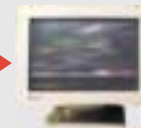
Unit



Interface



Data acquisition board

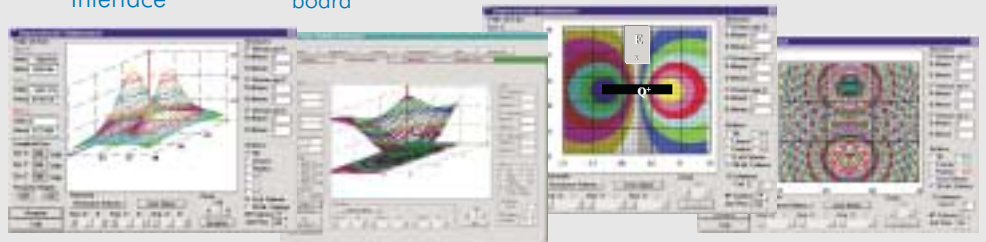


Software included:

- Control
- Data Acquisition
- Data Management

Used for:

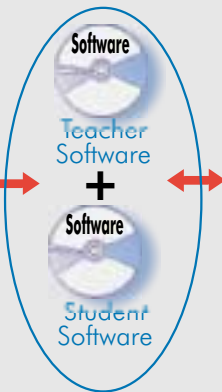
**Physics ( Magnetic fields, Electrical fields, Mechanics, Acoustics, Optics, Thermodynamics and Fluid Mechanics)**



## CAI. COMPUTER AIDED INSTRUCTION SYSTEM

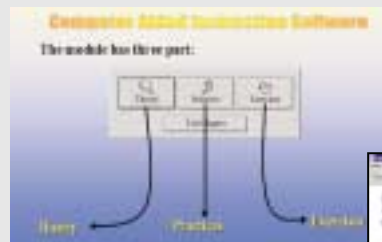


Unit



Used for:

**Basic Electronics and Electricity. Communications. Basic Mechanics. Basic Fluid Mechanics.**



## EDAS. EDIBON DATA ACQUISITION SYSTEM



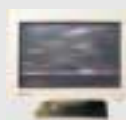
Unit



Interface



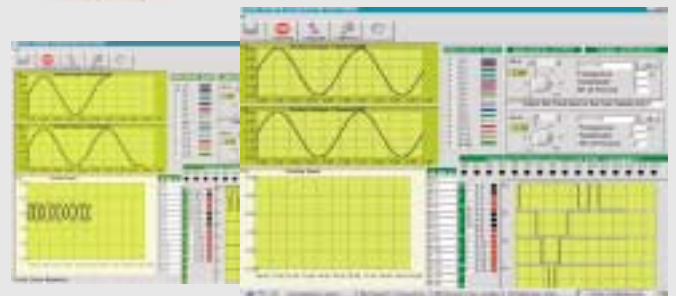
Data acquisition board



Data Acquisition Software

Used for:

**Basic Electronics. Communications. Electricity.**



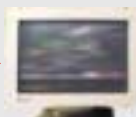
## RTC. EDIBON SYSTEM FOR HIGH ELECTRONICS (Real time control)



Unit



Data acquisition board

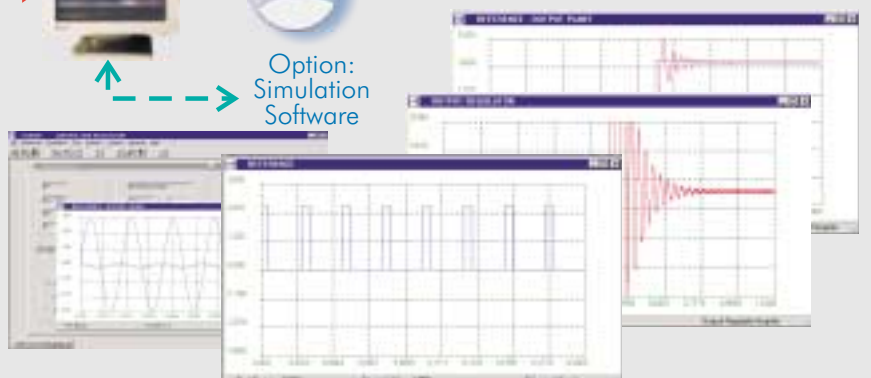


Control Software

Option: Simulation Software

Used for:

**High Tech Electronics (Control Electronics, Digital Electronics and Industrial Electronics).**



## HYBRID. EDIBON TEACHING HYBRID SYSTEM (ENERGY)

**EDIBON PATENT**

Used for:  
**Energy Power Plants.**



## PHOTOELASTICITY

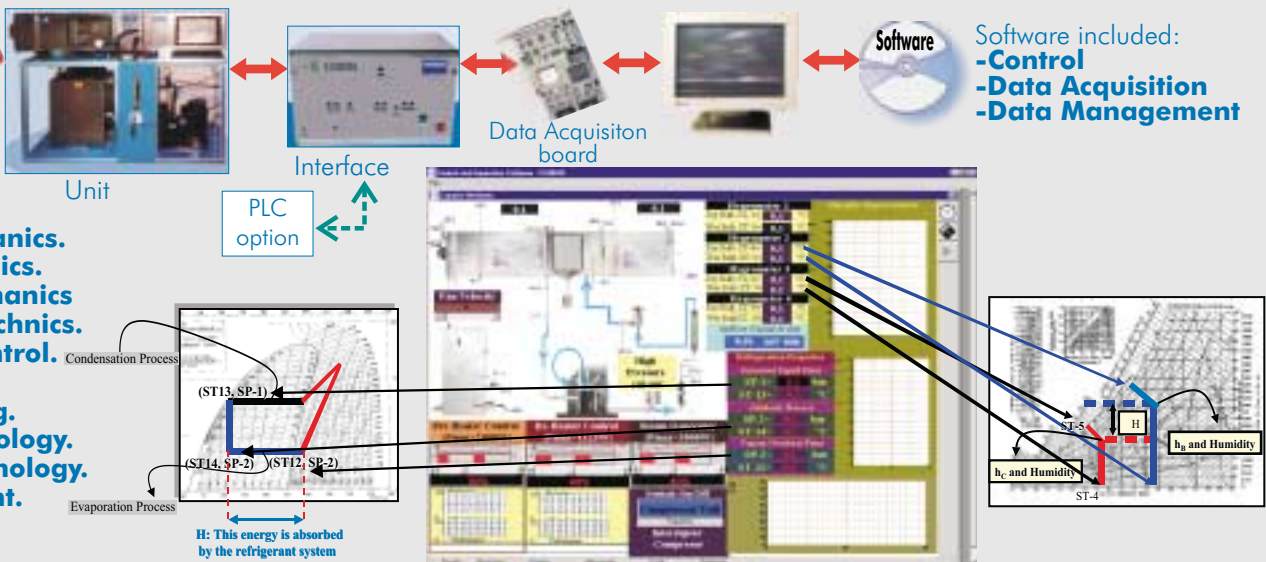
Used for:  
**Strength of Materials.**



## SACED. EDIBON COMPUTER CONTROL SYSTEM: Control+Data Acquisition+Data Management

**EDIBON PATENT**

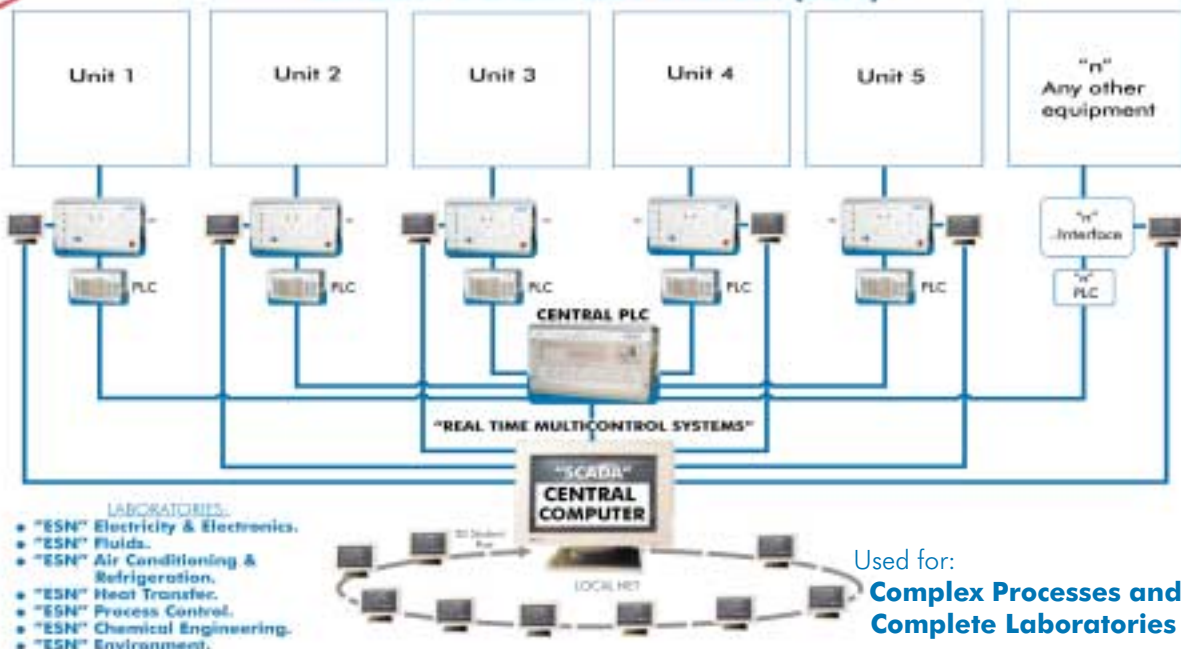
Used for:  
**Fluid Mechanics.  
Aerodynamics.  
Thermodynamics & Thermotechnics.  
Process Control.  
Chemical Engineering.  
Food Technology.  
Water Technology.  
Environment.**



## ESN. EDIBON SCADA-NET SYSTEM

**EDIBON PATENT**

### EDIBON SCADA-NET SYSTEM (ESN)



Used for:  
**Complex Processes and Complete Laboratories**